

## AMENDMENTS TO CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this application.

### **Listing of Claims:**

1-20. (Canceled)

21. (Currently Amended) A system for automated temperature measurement, comprising:

a processor unit;

a controller configured to host said processor unit;

a temperature measurement diode;

an integrated circuit coupled to the diode and the processor unit, said integrated circuit comprising an analog-to-digital converter configured to sequentially digitize analog voltage signals provided by the diode; and

a current source coupled to the diode and configured to generate a first current and a second current different from said first current; wherein

said processor unit is coupled to the current source and to the analog-to-digital converter, said processor unit configured

to control the current source such that the current source applies the first current to the diode at a first point in time and applies the second current to the diode at a second point in time,

to obtain a digital measure of a first voltage across the diode ~~from~~ from the analog-to-digital converter when the first current is applied to the diode,

to obtain a digital measure of a second voltage across the diode ~~from~~ from the analog-to-digital converter when the second current is applied to the diode, and

to determine a temperature proximate to the diode based on the first and second digital measures.

22. (Cancelled)

23. (Currently Amended) The system claim of 21, ~~further comprising:~~

wherein the processor is configured to generate and output a digital signal corresponding to the determined temperature.

24. (Previously Presented) The system of claim 21, further comprising:  
an I/O module external to the controller and configured to couple the controller to the A/D converter and to the current source.
25. (Previously Presented) The system of claim 24, wherein a second processor unit is contained within the I/O module.
26. (Previously Presented) The system of claim 21, further comprising:  
a temperature unit configured to host the diode, the A/D converter, and the current source.
27. (Currently Amended) The system of claim 21, further comprising:  
an I/O module external to the controller and configured to host the diode, the A/D converter and the current source.
28. (Previously Presented) A method for automated temperature measurement in a system, comprising:  
controlling a current source such that the current source sequentially applies a first current to a diode at a first point in time and applies a second current to a diode at a second point in time;  
measuring a first analog voltage across the diode when the first current is applied to the diode to produce a first analog voltage measurement;  
measuring a second analog voltage across the diode when the second current is applied to the diode to produce a second analog voltage measurement;  
sequentially digitizing the first and second analog voltage measurements in an integrated circuit comprising an analog-to-digital converter;  
determining a temperature proximate the diode based on the first and second digitized voltage measurements; and,  
providing a controller hosting a processor unit for controlling the current source and determining the temperature proximate the diode.
29. (Currently Amended) A system for automated temperature measurement, comprising:  
a temperature measurement diode;  
a current source;

means for controlling the current source such that the current source sequentially applies a first current to the diode at a first point in time and applies a second current to the diode at a second point in time, ~~said means for controlling the current source being coupled to the processor unit and the current source;~~

means for measuring a first analog voltage across the diode when the first current is applied to the diode and for measuring a second analog voltage across the diode when the second current is applied to the diode;

means for sequentially digitizing the first and second analog voltage measurements with an integrated circuit;

a processor unit for determining and storing a temperature proximate the diode based on the first and second digitized voltage measurements, said means for controlling the current source being coupled to the processor unit and the current source; and,

a controller configured to host the processor unit, and the means for controlling the current source.

30. (Previously Presented) The system of claim 29, further comprising:  
means for producing a digital output corresponding to the determined temperature.
31. (Cancelled).
32. (Previously Presented) The system of claim 29, further comprising:  
an I/O module external to the controller and configured to couple the controller to the current source.
33. (Currently Amended) The system of claim 32, wherein  
the I/O module is configured to host the ~~means for determining the temperature~~ processor unit.
34. (Currently Amended) A networked system for automated temperature measurement comprising:  
a network;  
a temperature unit having a temperature measuring diode, the temperature unit coupled to the network at a first location;  
a current source one of coupled to and forming part of the temperature unit ~~and the network~~ for applying a first current to the diode at a first time to generate a first voltage across

the diode and applying a second current different from the first current to the diode at a second time to generate a second voltage across the diode;

an analog to digital converter ~~coupled to~~ in the temperature unit ~~and the network~~ for converting the first voltage to a first digital signal and the second voltage to a second digital signal;

a processor in the temperature unit coupled to the analog to digital converter ~~and the network~~ for receiving the first digital signal and the second digital signal and determining a temperature proximate the diode based on the first digital signal and the second digital signal; and,

a controller connected to the network at a second location, the controller configured to provide a control signal over the network to the ~~current source~~ processor to apply the first and second currents to initiate the determination of the temperature proximate the diode and to receive a temperature signal from the processor.

35. (Currently Amended) The networked system for automated temperature measurement of claim 34 further comprising:

an I/O module connected to the network ~~coupled to the controller and the temperature unit, the I/O module~~ configured to for receiving the control signal from the controller and ~~to~~ sending the control signal from the controller to the current source and for receiving the temperature signal from the processor and sending the temperature signal to the controller.

36. (Previously Presented) The networked system for automated temperature measurement of claim 35 wherein the I/O module is connected to the network at a third location.

37. (Previously Presented) The networked system for automated temperature measurement of claim 35 wherein the I/O module is connected to the network at the first location and is electrically between the network and the temperature unit.

38. (Previously Presented) The networked system for automated temperature measurement of claim 35 wherein the I/O module is inserted into the controller.

39. (Previously Presented) The networked system for automated temperature measurement of claim 34 wherein the analog to digital converter and the processor are housed in the temperature unit.